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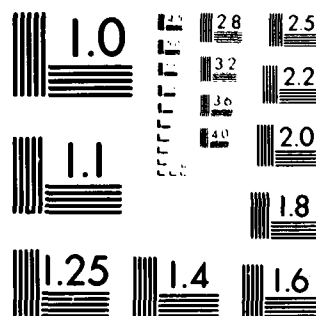
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Joint United States Military Assistance Group-Korea

DEFENSE ANALYSIS IN THE UNITED STATES

Presentation

to the

KOREA INSTITUTE FOR DEFENSE ANALYSES

by

Juri Toomepuu

6 April 1979

ABSTRACT

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The paper discusses analysis agencies in the United States Department of Defense elements, Federal Contract Research Centers, and defense analysis conducted by private research corporation. As an example of analytical activities in a military service, an overview of the U.S. Army analysis agencies is given. The paper also describes the U.S. DOD and Army process for planning, programming, conduct, and reporting of studies, and provides a list of references pertaining to studies and analyses.

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ANALYSIS AGENCIES

WHAT ARE STUDIES AND ANALYSES?

Among analysts, and among most other people for that matter, it is useful to define the terms that are used in a presentation or a discussion.

I will therefore start out by giving the definition of "Studies and Analyses," contained in DoD Directive 5010.22, The Management and Conduct of Studies and Analyses.

Studies and Analyses refers to those nonrecurring examinations of a subject undertaken to provide greater understanding of relevant issues and alternatives regarding organizations, tactics, doctrine, policies, force plans, strategies, procedures, intelligence, weapons selection and mix, systems, programs, or resources, and leading to conclusions and recommendations contributing to planning, programming, budgeting, decision-making and policy development including those studies initiated by or for the program management office. It also includes research and development of related data base structures and models for the support of studies and analyses.

As you see, the definition is quite broad, but it does by no means include all DoD analytical activities. For example, the entire Planning, Programming and Budgeting System (PPBS) and the various documents supporting it, such as Program Objectives Memoranda, Issue Papers, or Joint Planning Assessment Memoranda, require a great deal of analytical work by high level staff officers. This analytical work is part of their normal and recurring duties and does, therefore, not fall under this definition. Similarly, some work done by analyses agencies is excluded.

For the studies and analyses that meet the criteria of DoD Directive 5010.22, the same directive also provides specific policies and procedures for planning, programming, initiation, management, documentation, and implementation of results.

THE STUDY AGENCIES

In the United States, defense studies are done by three broad categories of agencies: In-House, Federal Contract Research Center, and Contractor.

In-House refers to studies done by the personnel assigned to any DoD element, such as the Office of Secretary of Defense, the Joint Chiefs of Staff and various joint commands, the various defense agencies, or the military services. Some of these studies may be done by specific analyses agencies, such as Assistant Secretary of Defense for Program Analysis and Evaluation, JCS Studies, Analysis and Gaming Agency (SAGA) or the Army Training and Doctrine Command Systems Analysis Activity (TRASANA); others are done by Special Study Groups, various other ad hoc study teams, or individuals.

Federal Contract Research Centers are civilian non-profit organizations chartered by the U.S. Congress specifically for the purpose of conducting defense studies. The people working there are not government employees, but the operating funds for these organizations are provided by the Federal Budget. In many ways those organizations are similar to the Korea Institute for Defense Analyses. There were at one time 37 of these Centers. Currently only seven retain this status. Others still exist, but operate as private research agencies. Among the best known of existing Centers are the Institute for Defense Analysis, the Rand Corporation, and the Center for Naval Analysis.

Finally, there are numerous private research organizations that do studies on a contract basis. Some of these specialize in defense analyses, others do work for other government agencies and private corporations.

The study projects available for contract are listed in the U.S. Department of Commerce Publications. Private companies may compete for these contracts, but they can also get study contracts non-competitively, when sole source procurement can be justified because of the company's unique qualifications or other circumstances.

Research companies doing classified work for the government must, of course, meet the laws and regulations pertaining to facility and personnel security clearances. Access to limited and classified information is provided to them, upon certification of their need to know by their government study sponsor.

A rough breakdown by percentage of costs of DoD studies done by these three categories of study agencies for various DoD elements is shown in Figure 1.

<u>DOD Element</u>	<u>In-House</u>	<u>FCRC</u>	<u>Contractor</u>	<u>Total</u>
Office of SecDef	2	3	5	10
JCS/Commands	1	-	-	1
Defense Agencies	4	3	12	19
Army	19	-	3	22
Navy	8	3	20	31
Air Force	8	3	5	16
U.S. Marine Corps	-	-	1	1
	42	12	46	100

Figure 1 Percent of DOD Study Costs

Source: David C. Hardison, Keynote Address, Proceedings, XV
Annual U.S. Army Operations Research Symposium, Oct 1976

How the manpower available for conducting studies is allocated to various topic areas is depicted in Figure 2.

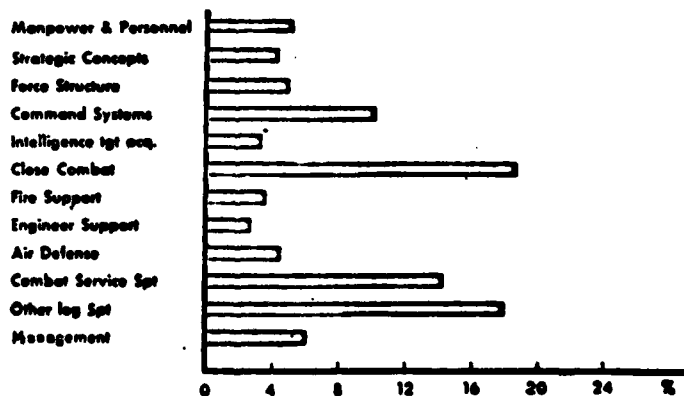


Figure 2 . Percentage Distribution of Study Manpower

Source: David C. Hardison, Keynote Address, Proceedings, XV
Annual U.S. Army Operations Research Symposium, Oct 1976

MAJOR IN-HOUSE STUDY AGENCIES

Let us look at some of the major "in-house" United States defense study agencies. We should keep in mind that although these agencies conduct studies with their own manpower resources, most of these also have studies done by Federal Contract Research Centers and private contractors.

Assistant Secretary of Defense, PA&E

At DOD level we have the Assistant Secretary of Defense, Program Analysis and Evaluation. The ASD, PA&E is the principal staff advisor and assistant to the Secretary of Defense for DOD program analysis and evaluation.

The ASD, PA&E is responsible for the following:

1. Develop policies, provide advice, make recommendations, and issue planning, fiscal, and materiel support guidance upon which Defense planning and program projections are based.
2. Perform analyses and evaluations of plans, programs, and budget submissions in relation to projected threats, estimated costs, resource constraints, and U.S. Defense objectives and priorities.
3. Identify issues and evaluate alternative programs.
4. Initiate programs, actions and taskings to ensure adherence to DoD policies and national security objectives; and to ensure that programs are designed to accommodate operational requirements and promote the readiness and efficiency of the forces.
5. Provide leadership in developing and promoting improved analytical methods for analyzing national security planning and the allocation of resources.
6. Review, analyze, and evaluate programs for carrying out approved policies and standards.
7. Serve on boards, committees and other groups pertaining to the ASD (PA&E)'s functional areas. Also, represent the Secretary of Defense on PA&E matters outside the Department of Defense.

The ASD, PA&E carries out these responsibilities in the following functional areas:

1. Force review of active and reserve components.
2. Strategic and theater nuclear forces.
3. Weapon systems and major items of materiel.
4. Nuclear warhead requirements.
5. Support systems.
6. Deployment plans and overseas basing requirements.
7. Mobility force programs and prepositioning plans.
8. Materiel support programs and war reserve stocks.
9. Force readiness and capabilities.
10. Contingency plans.
11. Security assistance programs.
12. Allied and foreign military requirements and capabilities.
13. Economic analyses and their impact on Defense programs.
14. Such other areas as the Secretary of Defense may from time to time prescribe.

In addition, the ASD, PA&E has the following responsibilities:

1. Perform critical reviews of requirements, performance and life cycle costs of current and proposed weapon systems.
2. Provide appropriate leadership and support of the Cost Analyses Investment Group in accordance with DoD Directive 5000.4.

DOD Directive 514.1, Assistant Secretary of Defense (Program Analysis and Evaluation), dated November 29, 1978, delineates the responsibilities, functions, relationships and authorities for the ASD, PA&E.

Joint Chiefs of Staff, SAGA

The Studies, Analysis, and Gaming Agency is responsible for preparing for the Joint Chiefs of Staff studies and analyses of military forces, weapon systems, plans and strategies; and for planning and performing joint war games and interagency politico-military simulations. Also, SAGA is responsible for improving analytical models, techniques, and procedures used in studies and analyses for the Joint Chiefs of Staff.

Organization for SAGA is shown in Figure 3.

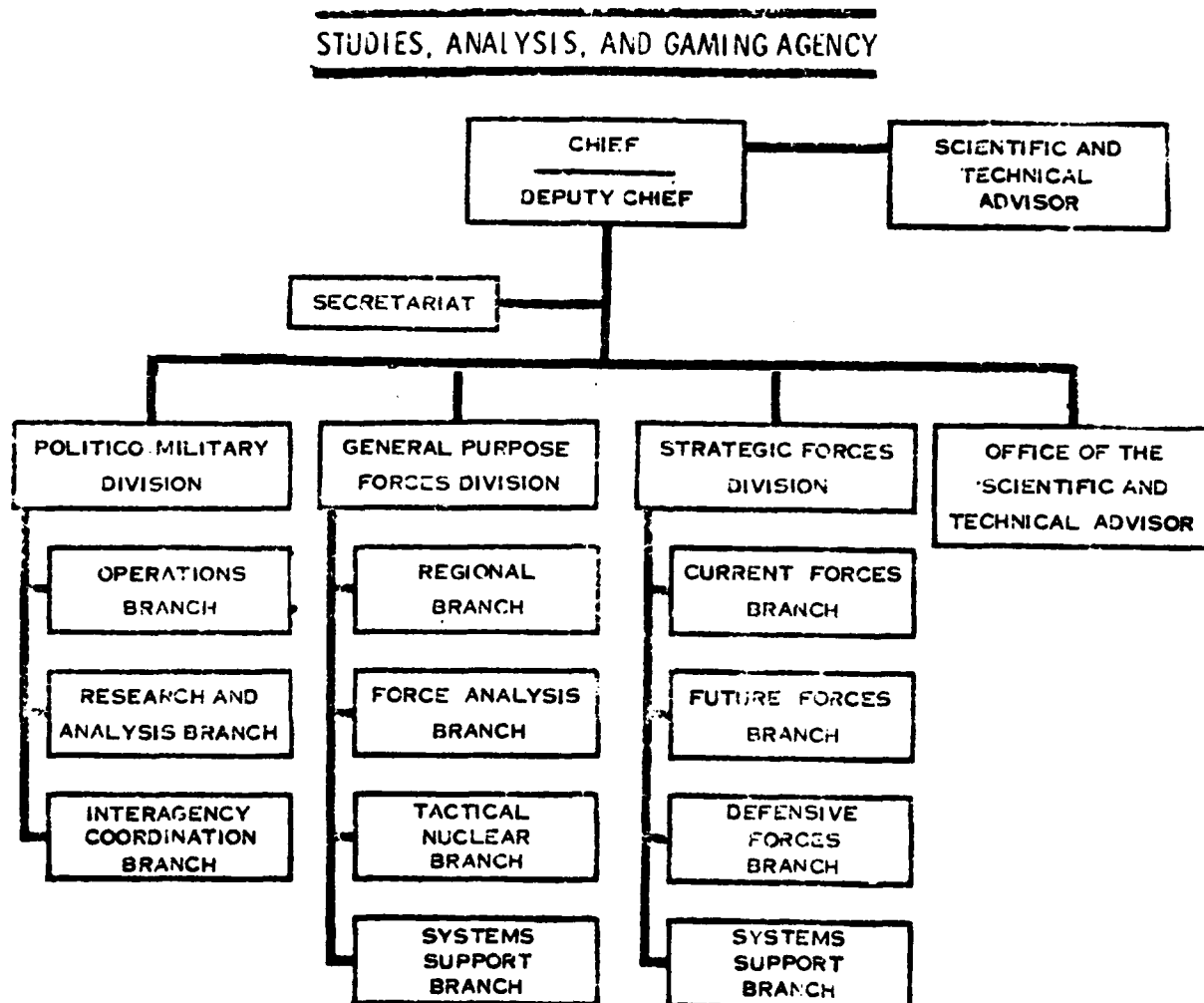


Figure 3. Organization of the JCS Studies, Analysis, and Gaming Agency

The Politico-Military Division develops and conducts interagency politico-military simulations and seminars, conducts various other politico-military analyses, and disseminates the results of their studies.

The General Purpose Forces Division performs analyses of general purpose forces, weapon systems, and strategies pertaining to conventional and tactical nuclear warfare. The Regional Branch of this Division conducts studies on specific areas, such as Europe or the Far East, and further on specific countries, such as the Republic of Korea.

The Strategic Forces Division conducts simulations (gaming) of joint general war plans. This Division prepares studies and comparative analyses of strategic nuclear offensive and defensive forces and weapon systems with full consideration for the nuclear environment. Further, they prepare conceptual studies and analyses of alternative military strategies and major combatant force structures pertaining to general war situations. The Chief serves as Chairman of the Red Planning Board.

The mission and functions for SAGA, and each of its divisions, are published in the Joint Chiefs of Staff Publication Number 4 (JCS PUB 4).

Military Services

Each of the military services has agencies dedicated for conducting studies and analyses. As is the case in DOD and JCS level, these agencies also augment their in-house resources with contractor support. Additionally, analysis teams or individual analysts are found at most general officer commands, and many analytical studies, such as cost and operational effectiveness analyses (COEA) for minor acquisition programs, are done, with the help of a COEA manual, by officers whose primary duties have nothing to do with analytical studies.

MAJOR ANALYSIS AGENCIES IN THE ARMY

Since this is the service with which I am most familiar, I will give an outline of the major analysis agencies and their primary responsibilities for the U.S. Army.

At the Department of the Army level we have the Office of the Deputy Under Secretary for Operations Research, who provides policy guidance for research activities in the Army.

At the Army headquarters, in the Office of the Director of the Army Staff, there is the Program Analysis and Evaluation (PA&E) Directorate, with responsibilities similar to the DOD level ASD, PA&E.

For the purpose of explaining the analytical activities within the Army, we can view the Army as a four-level hierarchy of operating systems.

The lowest level is concerned with individual weapons, the next level with small units (battalion and below), the third level with large units, such as divisions and corps, and the fourth and highest level deals with forces consisting of collections of units designed to perform specific missions.

The major analytical agencies in the Army have been given responsibilities corresponding to this hierarchy of systems.

Concepts Analysis Agency (CAA)

The CAA, a Department of the Army field operating agency located in Bethesda, Maryland, is responsible for conducting studies at the highest level of this hierarchy, in support of Army-wide general-purpose force planning and theater level force analysis.

The mission of CAA is to estimate the requirements for forces, strategic mobility, materiel, manpower, and other resources in conventional, nuclear, and chemical environments, to support Army inputs to the PPBS process.

CAA does its work mostly with the aid of computer simulations such as CEM, ATLAS, and AMMORATE. I want to stress the words "with the aid." The results of computer runs are not the end result of their studies, but merely input to the analyses effort.

The missions and functions of CAA are set forth in Army Regulation 10-38. Similarly, the mission and functions for other Army major headquarters and agencies are given in 10-series regulations. For other services similar regulations, with different numbering systems, are published. All of these are readily available through normal publications requisitioning channels.

TRADOC Analysis Agencies

The four-star Army Training and Doctrine Command (TRADOC) has the responsibility for the two middle levels of systems in the Army. The Combined Arms Combat Development Activity (CACDA) develops doctrine for and evaluates large unit systems, and conducts the tests and studies needed to carry out this responsibility.

TRADOC Systems Analysis Activity (TRASANA), located at White Sands, New Mexico, and various TRADOC Schools and Centers, such as Infantry School and Center at Fort Benning, Georgia, or Armor School and Center at Fort Knox, Kentucky, develop doctrine, tactics, and training for small unit systems, and have the responsibility for conducting the analytical studies in support of these activities.

TRASANA is mostly in studies and analyses business, but TRADOC Schools and Centers carry on a broad range of tasks inherent in their mission. Studies and analyses groups are usually assigned to both their combat developments and training developments departments.

Development and Readiness Command AMSAA

The Army Materiel Systems Analysis Activity (AMSAA), of the Army Development and Readiness Command (DARCOM), has the responsibility for testing and evaluating Army materiel systems at the individual item level, and for reporting the results in various study reports and joint munitions effectiveness manuals (JMEM's). AMSAA's work forms the foundation for evaluation of systems at the higher levels.

Interrelation of Operating Systems and Analysis

Operating systems within the hierarchy are interrelated. Systems at each level operate in the context of and contribute to achieving the goals and objectives of the next higher level system (e.g., the tank battalion as a subsystem of the armored division). Also, at each level, the system is made up of subsystems of lower levels (e.g., the tank as a subsystem of the tank battalion). Army analysis is similarly interrelated. Analysis at each level is done within the context of the next higher level system, and uses the operating concepts and systems performance of lower levels.

PLANNING AND CONDUCT OF STUDIES

THE STUDY SYSTEM

Department of Defense Directives on studies, and the implementing regulations, manuals, and pamphlets of the military services, establish a system for US defense studies and analyses, (as previously defined) with the following objectives:

- Insure that study efforts serve to conserve resources and make substantive contributions to planning, programming, and decision making process.
- Insure that each study effort is properly initiated, validated, and developed, and that results of the study are applied.
- Insure high-level visibility and adequate coordination of study efforts.
- Provide for dissemination of study results and information on the study program.

The study system is implemented by annual study programs, and by proper planning, management and conduct of individual studies.

INDIVIDUAL STUDIES

The life of a study is characterized by four phases: (1) initiation, (2) validation, (3) development and conduct, and (4) application.

A study may be initiated by either the directive from higher level command, or by a study proposal from any command with a need to investigate a particular problem area. In either case it is necessary initially to: (1) establish the need for the study; (2) define the problem; (3) determine the scope and a reasonable number of valid objectives for the study; and, (4) identify the users of study results and determine when the results are needed.

To accomplish this, and to avoid duplication of previously conducted studies, it is essential to conduct an initial literature search and review of all available reference materials that contribute to the understanding of the problem.

In the validation phase, the validity of the proposed study is confirmed by making the proposal known to all interested agencies, soliciting their comments, and coordinating and changing, as necessary, the requirements for the study.

The development and conduct phase begins when the study group, formed by the study agency, actually starts work, and ends when the study advisory group (SAG) or study project manager recommends approval of the final report.

The application phase consists of: (1) communicating the results to all affected agencies; (2) disseminating the results and lessons learned within the sponsoring organization; (3) making policy or program decisions, or recommendations to the decisionmaking authority; and (4) implementing the decisions by taking appropriate action.

The Study Directive

Study directive is the document that establishes the requirements and parameters for a study and also provides the guidelines for its management.

The study directive, although published by the command that exercises the authority for approving the study program, should usually be drafted by, or in coordination with, the agency that will conduct the study.

The directive is a management tool that describes the problem, states the objectives, and provides terms of reference; such as scope, limits, assumptions, essential elements of analysis (EEA), constraints, alternatives to be evaluated, measures of effectiveness (MOE), methodology, models and other applicable parameters.

In addition, the directive names the study sponsor and agency, outlines the support and resource requirements, e.g. the list of organizations tasked to contribute and the estimate of professional man-years required to conduct the study, and provides administrative instructions.

The administration paragraph provides the study schedule, action documents that must be produced by the study (e.g. policy directives, basis of issue plans (BOIP), or manpower authorization tables), security classification guidance, distribution of the study report, and control procedures.

Control procedures provide for the management mechanism for conduct of the study, such as a study manager, a steering committee, or a Study Advisory Group (SAG).

The Study Advisory Group, if used, is formed by the study sponsor, by appointing a chairman and deputy chairman, and inviting knowledgeable individuals from concerned agencies to provide either voting or observer members. Its function is to insure that the study remains oriented to the problem and to the established requirements, to review the progress of the study, to provide advice to the study sponsor and technical guidance for the conduct of study to the study group, and to coordinate between all concerned agencies.

The format for study directive is shown in figure 4. More detailed explanation of the study directive is given in Appendix H, AR 5-5. The Army Study System, and also in TRADOC pamphlet 71-3, Combat Developments Study Writing Guide

SUBJECT: Combat Developments Study Directive: (TITLE OF STUDY)

SEE DISTRIBUTION:

1. Purpose.
2. Reference(s).
3. Study sponsor.
4. Study Agency,
5. Literature search.
6. Study monitor.
7. Terms of reference:
 - a. Problem
 - b. Objectives.
 - c. Scope.
 - d. Time frame.
 - e. Limits.
 - f. Assumptions.
 - g. Essential elements of analysis (EEA).
 - h. Constraints.
 - i. Alternatives.
 - j. Operational concept.
 - k. Mission profile(s).
 - l. Measures of effectiveness.
 - m. Methodology.
 - n. Models.
 - o. Related studies.
8. Environment/threat guidance.
9. Support and resource requirements.
10. Administration:
 - a. Study title.
 - b. Study schedule.
 - c. Control procedures.
 - d. Study format or outline.
 - e. Action documents.
 - f. Coordination and other communications.
 - g. Distribution.
 - h. Security Classification guidance.

11. Correlation

Figure 4. The Study Directive.

Source: USATRADOC Pam 71-3, Combat Developments Study Writing Guide

The Study Plan

The format for the study plan is shown in Figure 5.

SUBJECT: Combat Development Study Plan: (TITLE OF STUDY)

SEE DISTRIBUTION

1. Purpose.
2. Reference(s).
3. Terms of Reference:
 - a. Problem.
 - b. Impact of problem.
 - c. Objectives.
 - d. Scope.
 - e. Limits.
 - f. Assumptions.
 - g. Essential elements of analysis (EEA).
 - h. Constraints.
 - i. Alternatives.
 - j. Operational concept.
 - k. Mission profile.
 - l. Measures of effectiveness.
 - m. Methodology.
 - n. Models.
 - o. Related studies.
 - p. Criterion of choice.
4. Environment/threat considerations.
5. Support and resource requirements:
 - a. Support requirements.
 - b. Resource requirements.
 - c. Data requirements.
6. Administration:
 - a. Study schedule.
 - b. Study outline.
 - c. Study project officer.
7. Correlation.

Figure 5. The Study Plan.

Source: USATRADOC Pam 71-3, Combat Developments Study Writing Guide

The study plan is based on the study directive. It elaborates on the topics covered in the directive, and provides the outline of technical and administrative procedures, a detailed study methodology, time schedule, and resource requirements.

If changes are required to the plan during the conduct of the study, they should be documented and approved by the command that issued the study directive. The thought and effort put into preparation of the study plan contributes directly to the study effort, and its quality is generally reflected in the study results.

Both the directive and the plan are designed to assure that the study is conducted in an orderly, systematic, and, preferably, standard fashion.

The Study Report

The final report prepared by the study agency is the primary vehicle for implementation of study results.

The final report should be distributed to all affected agencies, and the results briefed to the primary decision makers.

The final report must be written with the decision maker in mind, to assure that the decision options and recommendations have been clearly stated. Discussions of complex technical issues and presentation of supporting data, if needed, should be placed in appendices. The actions taken by the decision authority on the issues addressed in the study are based on the presented information and the judgement and experience of the decision maker. If the study report helps him to make that decision better, it has achieved its purpose. If it does not help, it is a failure even though the analysis may have been technically excellent.

To assure that work done on the study is readily available to others who may be investigating related or similar problems, and to avoid duplication of analytical work, the report should be placed in central technical libraries and listed in all publications catalogs.

The format and detailed technical specifications for publishing and distributing the study report of U.S. Army studies are contained in USATRADOC Pamphlet 71-3, Combat Developments Study Writing Guide.

REFERENCES

DOD DIRECTIVES

5010.22 The Management and Conduct of Studies and Analyses
5000.4 OSD Cost Analysis Improvement Group
5000.19 Policies for the Management and Control of Information Requirements
5000.20 Management and Dissemination of Statistical Information
5141.1 Assistant Secretary of Defense (Program Analysis and Evaluation)

DOD INSTRUCTIONS

5100.45 Centers for Analyses of Scientific and Technical Information
5154.19 Defense Logistics Studies Information Exchange
7041.3 Economic Analysis and Program Evaluation for Resource Management
7720.13 Research and Technology Work Unit Information

ARMY REGULATIONS

5-5 The Army Study System
10-5 Department of the Army
10-38 United States Army Concepts Analysis Agency
10-11 United States Army Materiel Development and Readiness Command
10-41 United States Army Training and Doctrine Command
11-18 The Cost Analysis Program
11-28 Economic Analysis and Program Evaluation for Resource Management
70-1 Army Research, Development and Acquisition
70-11 Defense Documentation Center for Scientific and Technical Information(DDC)
70-31 Standards for Technical Reporting
71-9 Cost and Operational Effectiveness Analyses(COEA)
381-11 Threat Analysis

OTHER PUBLICATIONS

DA Pamphlet 5-5 Guidance for Study Sponsors and Study Advisory Groups
USATRADC Reg 11-8 TRADOC Analyses in Support of the Materiel Acquisition Process
USATRADC Reg 71-4 TRADOC Standard Scenarios
USATRADC Pamphlet 11-8 Army Programs Cost and Operational Effectiveness Analysis Handbook
USATRADC Pamphlet 71-3 Combat Developments Study Writing Guide